Deschutes River, Capitol Lake, and Budd Inlet
TMDL Advisory Group Meeting

Thursday, September 22, 2011 -- 9:00 a.m. to 11:35 a.m.
Tumwater Fire Department, 300 Israel Rd. SW, Tumwater

Attendees

Black Hills Audubon Society
- Sue Danver

Citizen
- John DeMeyer
- Gary Larson

Deschutes Estuary Restoration Team (DERT)
- Zena Hartung

Ecology, WA State Dept. of
- Bob Bergquist
- Chuck Hoffman
- Kim McKee
- Greg Pelletier
- Brett Raunig
- Mindy Roberts
- Lydia Wagner

Environmental Protection Agency (EPA)
- Dave Ragsdale

General Administration (GA), WA Dept. of
- Carrie Martin

LOTT Clean Water Alliance
- Karla Fowler
- Laurie Pierce
- Brian Topolski

Olympia, City of
- Laura Keehan
- Patricia Pyle

Olympia, Port of
- Robert Zinkevich

Olympia Yacht Club
- Jim Lengenfelder

Thurston County Environmental Health
- Sue Davis

Thurston County Water Resource Program
- Rich Doenges

Thurston Public Utilities District
- Chris Stearns

Transportation (WSDOT), WA State Dept. of
- Jana Ratcliff

Tumwater, City of
- Dan Smith

Modeling Alternate Scenarios

Mindy Roberts and Greg Pelletier, Department of Ecology, Environmental Assessment Program

Technical Report Update: Mindy stated the TMDL Technical Report that was out for review in October 2008 is still a working document. They are preparing responses received during the external review period and will finalize the report in December 2011. Ecology will publish and post online the final version in January 2012. The final technical report includes data collected, bacteria statistics, recommendations, and modeling for both temperature and dissolved oxygen. Part of the strategy for the technical report is to use data to describe how things move around in the waterbodies and determine the fate of different outcomes. Only four simple scenarios for Budd Inlet and Capitol Lake are included.

Modeling to help determine load and wasteload allocations: Load and wasteload allocations (LA/WLA) are not included in the technical report. These will be determined during the TMDL process and will get included in the submittal report targeted for January 2013. Reductions are needed from both point sources and nonpoint sources. How will Ecology determine the LA/WLAs? The original computer model used was one designed for the LOTT Clean Water Alliance. Ecology then contracted with the original

design to modify the three-dimensional model. Now we need to modify the model further to run different scenarios and predict the outcomes. This data will help determine the LA/WLAs. We need to consider the water quality benefit to the scenarios. Greg Pelletier is in charge of the modeling team and will translate ideas brought forward by this group. Some can be used in the model for future runs. Greg will come back to the group in January 2012 to provide feedback on the ideas coming from this group and other sources.

Greg provided an overview of the handout, "DO depletion relative to natural (WQS <0.2 mg/L)." The scenarios are:

1. Baseline estimated natural conditions. Wastewater treatment plants (WWTPs) are assumed to be at zero flow; the Deschutes River and other tributaries were estimated to be at natural conditions based on the lowest nutrient levels measured historically.
2. Current nonpoint sources. All tributaries and nonpoint sources discharge at existing conditions, and point sources/WWTPs are set to zero.
3. Current point and nonpoint sources. All WWTPs and tributary nonpoint sources were set to existing conditions.
4. Permitted point sources and current nonpoint sources. WWTPs were set to permit limits; nonpoint sources were set to existing conditions.

More information on these scenarios are found in the draft technical report on pages 205-210 and Appendix I, Development of Loading Scenarios for the Capitol Lake and Budd Inlet Models.

Website links:

- October 2008 Draft Technical Report: *Deschutes River, Capitol Lake, and Budd Inlet Temperature, Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Fine Sediment Total Maximum Daily Load Water Quality Study Findings*: http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/technical_reports/DeschutesBudd_TMDL_extrev1_1008.pdf.
- Appendix I, *Development of Loading Scenarios for the Capitol Lake and Budd Inlet Models*, begins on Page 76: http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/technical_reports/Deschutes_appendices_extrev.pdf.

Discussion: Mindy provided a brief summary of the dissolved oxygen water quality standards. We need to find ways to control nitrogen in a model scenario. She asked the group to think about circulation, sources (sediments, rivers, WWTPs, atmospheric deposition), temperature (chemistry related parameter) when suggesting possible scenarios.

Q: What about other smaller tributaries and Ellis Creek? Are these a concern as well?
A: *Yes, smaller streams are a concern because their nutrients get loaded into Budd Inlet.*

Q: Do other biomass affect the water quality?
A: *Algae need different proportions of nitrogen and phosphorus. In marine water, if you reduce nitrogen you reduce algae growth. In fresh water, if you reduce phosphorus you reduce algae growth. It varies from system to system.*

Q: How do fecal coliform bacteria affect Budd Inlet?
A: *Fecal coliform bacteria listings for the tributaries flowing into Budd Inlet have to meet water quality standards at the mouths of those tributaries. Shellfish areas have more monitoring for fecal coliform. Today we are concentrating the discussion on modeling for Capitol Lake, Budd Inlet, and the nearby tributaries.*

Comment: Models can adjust incoming nutrients to affect dissolved oxygen (DO). The submittal report will have targets for nutrients to address DO.
Response: *We do not have to limit the scenarios to nutrients. We start with nutrients but think about other sources. Circulation is another factor so consider scenarios which could affect it. Cooler water holds more oxygen. Capitol Lake is warm for temperature and holds less oxygen. The area closest to Priest Point Park has sluggish circulation and north of there has a little better circulation. There isn't much tidal circulation in the lower end of Budd Inlet.*

Q: Does the model consider seasonal variations?
A: *It looks at natural baselines versus manmade conditions. The Budd Inlet/Capitol Lake (BI/CL) model is different than the Deschutes River version. The critical period for BI/CL is usually October.*

Q: Why aren't these standards averaged?
A: *You can't do this in order to make the problem go away. It isn't a water column average but a "worst case".*

Q: Will there be changes in Appendix I?
A: *No. We need to look at natural conditions for nutrients and add in the human contributions for point and nonpoint sources. Appendix I lays out how we determined the natural conditions. The Deschutes River has the highest levels of concentrations in the state at .8 mg/L. You can't make a system fall below the <5/6 mg/L. If natural conditions are already there, you can't let it go down any more than <0.2 mg/L.*

Q: In the four scenarios, you start putting standards for freshwater. What happens to the standards for phosphorus since freshwater is out of compliance but marine waters meet the standards?
A: *Capitol Lake is impaired for phosphorus. To establish what is natural phosphorus loading, we look at the dissolved oxygen standard. Phosphorus is a 303(d) listing threshold. If the lake is changed to an estuary it would remain on the list. We are still looking at the dissolved oxygen standards and you still can't have the human change result in more than <.2 mg/L.*

Q: Will the submittal report have Phosphorus reductions in addition to dissolved oxygen?
A: *Maybe.*

Q: What are the effects of tidal flushes and neap tides?
A: *We can see tidal patterns in the dissolved oxygen results. There are two types of tides: spring and neap. With spring tides there are higher high tides and lower low tides. With neap tides, these extremes are dampened. A neap tide will result in water sloshing back and forth more slowly. Lower levels of dissolved oxygen often appear during neap tides (generally in September). This allows algae to grow more because there is more circulation. So tides do have an impact. We look at critical times of the year and some trends are predictable. Algae growth is affected by circulation, temperature, and other sources such as sediments, wastewater treatment plants, and atmospheric deposition.*

Q: Describe algae.
A: *Plants need sunlight, water, and nutrients. They convert sun energy to meet their own needs. They take in oxygen and put out carbon monoxide. When they die and decompose there is bacteria acting as the decomposers and using up the oxygen. Algae tend to float. In Capitol Lake there was milfoil (macrophytes) already present and rooted at the bottom of the lake. After the macrophytes died off the algae increased. There are different types of plants in Budd Inlet which tend to float or suspend on the water. In the Deschutes River, the plants tend to sink to the bottom and in Capitol Lake it is a combination of both.*

Q: Does the technical study include the non-LOTT wastewater treatment plants?
A: *Yes.*

Q: How do other studies focused north of the Tacoma Narrows affect the water? They aren't treating for nitrates the way LOTT is.
A: *For the model we look at north of Boston Harbor and don't change them. All other component changes happen below that marking line. The modeling tool focuses on Budd Inlet. Most of our scenarios are focusing on changing parts in those areas.*

Q: How do we determine human conditions of more than <0.2 mg/L?
A: *We turn on/off different sources. We can't go upstream and downstream so instead look at scenarios as more of a before and after.*

Comment: Where natural conditions don't match the water quality standards, we can't grade on a curve. Polluters may look at a area by area basis to determine if they are meeting standards. We don't have this luxury.
Response: *Some data already show sensitive systems. We can't further impact those systems which is why the <0.2 mg/L is in place.*

Comment: We need to consider the impacts of stormwater. We have the most hard surfaced areas. Even in Capitol Lake there are outfalls adjacent to it. Stormwater not processed by LOTT is a contributor.
Response: *Stormwater is evolving over time. Stormwater is reflected in patterns coming in from the Deschutes River and Percivial Cove. It could add another 1%. We need to think about how to represent this area in the final Technical Report or in the TMDL submittal.*

Q: Does the natural condition model reflect higher nutrient systems in the lower watershed than other basins?
A: *New information showing other Puget Sound watersheds will be posted on Ecology's website. Concentrations of nitrogen in rainfall is extremely low. The headwaters in the Cascades get more precipitation and have more volume of rainfall. Data shows differences in the Olympic and Cascade Mountains. The Deschutes River doesn't have headwaters in the Cascades and doesn't benefit from the rainfall. There are strong geological influences in the Deschutes River. We don't have a big body of data before higher population density. There are other ways to get at natural conditions by looking at reference streams. We look at multiple lines of evidence.*

Comment: We should put "natural" in quotes because how can you find what is the original natural conditions?
Response: *It is not impossible. In the Deschutes River we know the direction. Appendix I it lists the lines of evidence. We went back to the 1980s and saw an increasing trend over time. Another tool established by EPA headquarters is to look at today's data set and do percentile calculations in the 5 and 25 percentile ranges. In the early 1980s it was .4 mg/L.*

Comment: Nitrates levers are increasing over time. You have to select critical conditions. Will the ones we choose be relevant in 20 years? The flows of this winter and spring may be an anomaly. Stream flow is relative to groundwater. How do we address trends while setting targets?
Response: *Perhaps this is an outside the box idea to consider. Perhaps we can look at climate impacts, projections, or stream flows.*

Comment: The Spokane River has over 100 years of flow info. Look at the trend of a linear decline. If we set our loading targets based on information from 2001, it might not be relevant when the TMDL is submitted and implemented.
Response: *Ecology addresses this through the implementation plan and adaptive management strategy. We need to see best management practices (BMPs) implemented and then assess their effectiveness. If they aren't working, regroup and identify new actions to take.*

Comment: Climate can impact the outcomes. Nobody doubts human and animal derived factors have effected water quality over time. The Thurston County Planning Council predicts population increase. As the county grows, are these considerations taken in? Areas close to the city will continue to grow and incur more stormwater impacts.
Response: *We look at this as a "pollution pie". If it is too big, we need to shrink it and decide how to piece it out. Do we reserve one piece for growth? Generally this issue is part of another process outside the TMDL. The Water Quality Program will have to make the decision to reserve the growth pie.*

Q: On sources and modeling, can you adjust and account for the groundwater inputs?
A: *We stop the Deschutes River in the model at Capitol Lake. We run the model for critical conditions. We may be able to use the tool to explore other impacts.*

Brainstorming Exercise: *The following are the flip chart notes taken during the meeting.*

Lake Aeration
- Solar powered

Septics (within UGA?)
- Shift to centralized wastewater
- Reduce N to GW

Drinking water wells
- Septic v. centralized

Deschutes – engineering log jams
- Erosion, sediment control
- Habitat benefit

Lake weed harvesting
- Lake treatments to inactivate P
- Lake benefits
- ? Budd Inlet benefit

Bioremediation
- (lake, marine) - temp

Wetland Restoration
- Freshwater
- Multiple bens – aq. Recharge, temperature

Outfall Extension at WWTP to better circulation area
Stormwater – 15,000 rain gardens (strong worded local effort) (?) stormwater OF
Consider external inputs from SPS/PS

Wastewater reclamation, re-use, e.g. Hawks Prairie
- GW recharge, O augment

Programmatic controls – P in detergents, fertilizers
→ Clarify statewide legislation
Evaluate McAllister Springs effort at county level
Temperature ↓ in lake or estuary
Coord w/ TC – WS Characterization
→ Land conversion

Critical Areas
- Implementation - ? Deschutes temp

Land acquisition – measures to manage riparian areas
- ? prioritize implementation?

Urban + sub basin tree canopy – temp of stormwater – delivery of contaminants
Lake back flushing

Effective impervious cover reduction (multiple benefits = salmon, temperature, WQ)
Mitigate/avoid roof runoff
Shellfish as restoration
- Mussels (not food) as N sink

Cluster housing, septics (implementation) + compensation = WL restoration
Restore estuary dam (?) + to 300 ft open – circ, temp, sediments

Port – aerators in BI installed at marina 1990s, Swantown in E. Bay
Nutrient trading
Pleasure boat waste disposal (marinas, out)
No discharge zone

- Liveaboards, boaters
- Wastewater, gray water

Advance treatment for all WW discharges, all the time

- Big + small
- All seasons

Cross connections in urban areas (sanitary → stormwater)
Public education effort (implementation) effectiveness of
Illegal stormwater – higher fines, dry weather discharges
Vesting issues – future 7 years development
Animal waste

- Livestock
- Pet waste

} Relative contribution to NPS for model (+ implementation)

Quantifying PS, NPS
Eliminate outfall to Capitol Lake

- Stormwater pollutants
- Related to rain gardens

Forest coverage class (Deschutes hws) infiltration in upper watershed
Water conservation

Acronyms:

BI: Budd Inlet
GW: Groundwater
HWS:
N: Nitrogen
NPS: Nonpoint Sources
OF: Outfalls
P: Phosphorus
PS: Point Sources
SPS/PS: South Puget Sound/Puget Sound
TC: Thurston County
UGA: Urban Growth Area
WL: Wetlands
WQ: Water quality
WS: Watershed
WW: Wastewater
WWTP: Wastewater treatment plant

Open Comment

- None this month.

Next meeting

Date: Thursday, October 27, 2011
Time: 9:00 a.m. – 12:00 noon
Place: Tumwater Fire Department, 300 Israel Rd. SW, Tumwater
Agenda: Lower Watershed Summary, Implementation Strategy Components